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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/816,942	03/23/2001	Stephen Christopher Kitson	30001063	6960

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EXAMINER

DUONG, THOI V

ART UNIT

PAPER NUMBER

2871

DATE MAILED: 05/21/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/816,942

Applicant(s)

KITSON ET AL.

Examiner

Thoi V Duong

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 03 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 March 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2 and 4-29 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2 and 4-29 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

1. This office action is in response to the Amendment, Paper No. 7, filed March 03, 2003.

Accordingly, claims 1, 2, 4-13, 15-24 were amended, claim 3 was cancelled, and new claims 25-29 were added. Currently, claims 1, 2 and 4-29 are pending in this application.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(e) the invention was described in-

(1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effect under this subsection of a national application published under section 122(b) only if the international application designating the United States was published under Article 21(2)(a) of such treaty in the English language; or
(2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that a patent shall not be deemed filed in the United States for the purposes of this subsection based on the filing of an international application filed under the treaty defined in section 351(a).

3. Claims 1 and 4-24 stand rejected under 35 U.S.C. 102(e) as being anticipated by Bryan-Brown et al. (USPN 6,456,348 B2) for the same reasons set forth in the last office action for claims 1 and 3-24.
4. Claims 28 and 29 are rejected under 35 U.S.C. 102(e) as being anticipated by Bryan-Brown et al. (USPN 6,456,348 B2).

As shown in Figs. 1, 2, 7a and 7b, Bryan-Brown discloses a bistable nematic liquid crystal device comprising:

a first cell wall 3 and a second cell wall 4 enclosing a layer 2 of nematic liquid crystal material;

electrodes 6, 7 for applying an electric field across at least some of said liquid crystal material;

a first surface alignment 25 on the inner surface of said first cell wall and a second surface alignment 26 on the inner surface of said second cell wall providing alignment to the liquid crystal molecules (col. 4, line 65 through col. 5, line 6);

wherein said first surface alignment comprises an array of posts which have at least one of a shape and an orientation to induce a liquid crystal director adjacent said posts to adopt two different tilt angles in substantially the same azimuthal direction (col. 3, lines 30-63);

said posts each having a surface comprising a material which is in contact with said liquid crystal material, excluding a material which induces homeotropic alignment in liquid crystal materials (col. 3, lines 52-63);

said second surface alignment inducing a local homeotropic alignment of a liquid crystal director (col. 6, lines 14-53);

the arrangement being such that two stable liquid crystal molecular configurations can exist after suitable electrical signals have been applied to said electrodes (col. 3, lines 33-35).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claim 2 stands rejected under 35 U.S.C. 103(a) as being unpatentable over Bryan-Brown et al. (USPN 6,456,348 B2) in view of Jones et al. (WO 99/34251) for the same reasons set forth in the last office action. In addition, the homeotropic orientation is well described by Jones in page 7, lines 1-23.

7. Claims 25-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bryan-Brown et al. (USPN 6,456,348 B2).

Bryan-Brown discloses a bistable nematic liquid crystal device that is basically the same as that recited in claims 25-27 except for specific shape of the posts. However, Bryan-Brown discloses that the gratings may have any shape and may be embossed as posts so as to permit the liquid crystal molecules to adopt two different pretilt angles in the same azimuthal plane (col. 3, lines 30-63). Accordingly, with the teaching of Bryan-Brown, it would have been obvious to one having ordinary skill in the art at the time the invention was made to produce a desired grating profile for the post which is cylindrical or has a cross section selected from a square shape or an oval shape or a diamond shape so as to permit the liquid crystal molecules to adopt two different pretilt angles in the same azimuthal plane.

Response to Arguments

8. Applicant's arguments filed March 03, 2003 have been fully considered but they are not persuasive.

With respect to claim 1, Applicant argued that Bryan-Brown fails to disclose or suggest a surface alignment comprising an array of posts and the Office action incorrectly asserts that the small pillars of Bryan and Brown are posts. Applicant also argued that the "surface alignment grating", not the "small pillars", of Bryan-Brown is used for aligning the liquid crystal material and the small pillars are simply for spacing the cell walls and as a barrier to material flows. The Examiner disagrees with the Applicant's remarks because Bryan-Brown discloses that both cell walls are embossed with small pillars (of 1-3 micrometers height and 5-50 micrometers or more width) in the inner surfaces to provide a grating wherein the pillars may be formed by the material of the alignment layers (col. 3, lines 46-63). Thus these small pillars are not only for spacing the cell walls and as a barrier to material flows but also for a surface alignment grating and they are similar to the "posts" (of 0.5 to 5 micrometers height in claim 4 or 0.9 to 1.3 micrometers height in claim 5) of the Applicant's invention. Moreover, according to Merriam Webster's Collegiate Dictionary, tenth edition, "pillar" is clearly defined as "post". It is also clear that the height of these pillars is well within the range of the height of the posts recited in claims 4 and 5; especially, at the lower side of the range, the pillars seem to be taller than the posts of the instant invention.

With respect to claim 7, Applicant argued that Bryan-Brown fails to disclose or suggest at least part of the side wall of the posts being tilted at a tilt angle with respect to the normal to the plane of the first cell wall in the range of about 5 to 7 degrees. The Examiner disagrees with the Applicant's remarks since Bryan-Brown discloses that the rubbing direction on the polyimide surface is set parallel to the grating groove direction

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on the grating surface and by arranging the groove directions non parallel to the rubbing alignment direction about 5 degrees, the twist disclinations may be prevented (col. 9, lines 14-16 and 54-58). Accordingly, the rubbing direction will be normal to the plane of the cell wall when the post is squared (the side wall of the post is normal to the plane of the cell wall); therefore, the grating groove direction is set to be tilted (or non parallel) at 5 degrees to the rubbing alignment directions to prevent disclinations.

With respect to claim 10, Applicant argued that Bryan-Brown fails to disclose or suggest an arrangement in one of a random or pseudorandom array. The Examiner disagrees with the Applicant's remarks because Bryan-Brown discloses that the grating may have the same or different shape and the grating profile may vary within each pixel area, and or in the inter pixel gaps between electrodes (col. 3, lines 46-49). Thus, the gratings are arranged at random due to variance of the grating profile.

With respect to claim 22, Applicant argued that Bryan-Brown teaches away from the twist being induced by chiral doping of the liquid crystal material as indicated in col. 9, lines 54 and 55 "A cholesteric dopant may be added to prevent twist disclinations". The Examiner disagrees since, as known in the art, a cholesteric dopant is added for the purpose of inducing twist by removing the degeneracy in the sign of the twist (or twist disclinations) and the twist cell will have a uniform structure throughout its entire area when the disclinations disappear.

Finally, with respect to claim 2, Applicant argued that Jones fails to disclose a surface alignment comprising an array of posts and that Jones fails to disclose a homeotropic alignment of the director. The Examiner disagrees since, in addition to the

planar and tilted homogeneous alignments, Jones also teaches a homeotropic orientation of the liquid crystal molecules induced by a surface alignment comprising a grooved profile or grating (page 7, lines 1-23).


Conclusion

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thoi V. Duong whose telephone number is (703) 308-3171. The examiner can normally be reached on Monday-Friday from 8:00 am to 4:30 pm. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Kim, can be reached at (703) 305-3492.

Thoi Duong
05/05/2003


TOANTON
PRIMARY EXAMINER